Artificial intelligence in innovation management: A review of innovation capabilities and a taxonomy of AI applications

Abstract

Artificial intelligence (AI) is a promising generation of digital technologies. Recent applications and research suggest that AI can not only influence but also accelerate innovation in organizations. However, as the field is rapidly growing, a common understanding of the underlying theoretical capabilities has become increasingly vague and fraught with ambiguity. In view of the centrality of innovation capabilities in making innovation happen, we bring together these scattered perspectives in a systematic and multidisciplinary literature review. The aim of this literature review is to summarize the role of AI in influencing innovation capabilities and provide a taxonomy of AI applications based on empirical studies. Drawing on the technological–organizational–environmental (TOE) framework, our review condenses the research findings of 62 studies. The results of our study are twofold. First, we identify a dichotomous view of innovation capabilities triggered by AI adoption: enabling and enhancing. The enabling capabilities are those that research identifies as enablers of AI adoption, underscoring the competencies and routines needed to implement AI. The enhancing capabilities denote the role that AI adoption has in transforming or creating innovation capabilities in organizations. Second, we propose a taxonomy of AI applications that reflects the practical adoption of AI in relation to three underlying reasons: replace, reinforce, and reveal. Our study makes three main contributions. First, we identify the innovation capabilities that are either required for or generated by AI adoption. Second, we propose a taxonomy of AI applications. Third, we use the TOE framework to track trends in the theoretical contributions of recent articles and propose a research agenda.